

extending in a row from above the centre of the cavity down and forward upon the base of the cardinal teeth. Three well impressed muscle scars in front, two behind, the later almost confluent. Habitat, Kux Creek, Chama, Guatemala. Collected by Mr. A. A. Hinkley, Feb. 6, 1917. A few dead specimens were obtained on the bank of the Isaibha River (Chama) of which the Kux Creek is a tributary. Type in Academy Natural Sciences. Cotypes in collection of A. A. Hinkley, the author and U. S. N. Museum.

I place this species in *Psoronaias* Crosse and Fischer, type *U. psoricus*, because of its evident relationship to *crocodilarum*, and *distinctus*, differing mainly from the latter in size and degree of inflation, being much inferior in both respects to *distinctus*.

ON THE RATE OF GROWTH OF POND UNIOS.

BY L. S. FRIERSON.

During the latter part of March 1916, the writer, for the purpose of constructing a fish pond, excavated a barrow-pit near the bank of a small creek, about ten feet wide, and at the time nearly dry. The barrow-pit was perhaps one hundred feet long, fifty feet wide and three feet deep. Early in April, 1916, the pit became full of water, overflowing from the adjacent creek, and together with two subsequent overflows, supplemented with seepage from the newly constructed fish pond, the pit remained more or less full of water, until May 25, 1917, when it was drained by a ditch into the nearby creek. From the dried bottom of this pit some thirty Unios were picked up by the writer. Ten of these were *Unio tetralasmus* Say, and the rest were *T. texasensis* Lea. All the specimens were of remarkably uniform size and appearance. The *texasensis* being about one and a half inches, and the *tetralasmus* two and a half inches long. Exact dimensions of a *texasensis*: length 43, height 24, diam. 16 mm.; of *tetralasmus* 75, 40, and 25 mm.

Both of these species had attained puberty. A female *texasensis* has its gills fairly full of young glochidia. A *tetralasmus* had several (three or four) ovisacs with a few (remaining)

glochidia. In assigning an age to these shells it is quite sure that the *tetralasmus* discharges its glochidia in March and early April, so that when picked up on May 25, these shells were just about fourteen months old, from the date of discharge from their mother's gills.

In the case of the *texasensis* (which spawns somewhat later) it is possible that these were dropped by fish of which, at least six species) obtained access to the pit on May 7, 1916 (on which date an overflow occurred), thus making about thirteen months. At any rate the maximum age of either species is fourteen months from their mother's ovisacs. One of the *U. tetralasmus* is shown of natural size in Pl. VII, fig. 4.

Another observation concerning pond mussels might here prove of interest. A large pond was cut into two by a railroad embankment, a culvert preserving the level and providing communication between the two. In the lower and larger pond a half-bushel of Yonkapiin (*Nelumbium luteum*) seed was sown. It was six years before these seed germinated. These plants, during the summer, cover the entire surface of the pond with their broad peltate leaves. In this pond the writer planted a colony of a dozen *Anodonta grandis*. Several years after, taking advantage of extreme low water, the writer made a careful survey of these twin ponds, with the result that hundreds of Anodons could be found in the upper pond, but not a single one was found in the lower pond. Either the shade killed the young shells, or else the glochidia-laden fish avoided the shade of the lotus plants and congregated in the upper pond (there are no *Nelumbii* in the upper pond). Is not this avoidance of shade a reason for the paucity of unios in the tropics?

A NEW SOUTH AFRICAN NESOPUPA.

BY H. A. PILSBRY.

NESOPUPA FARQUHARI, n. sp.

Among Pupillidae sent by Mr. J. Farquhar there is a new species from Grahamstown which may be defined by comparison